NCI SETS GOAL OF ELIMINATING SUFFERING AND DEATH DUE TO CANCER BY 2015

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During the past year as the director of the National Cancer Institute (NCI), the federal government's premier agency for cancer research, I talked with leading cancer researchers to assess the state of the field. After much dialogue, what became clear to me is the need to focus our efforts into a cohesive strategy.

I have proposed a challenge goal for the field of cancer research—to eliminate suffering and death due to cancer by 2015. I want to share this challenge goal with the National Medical Association because it is my desire to enlist your support. I believe that we must all pull together to steer the most productive course for the future of cancer research and care.

I issued this challenge because I believe we are at a "strategic inflection" in oncology, a point of unprecedented growth in three key areas related to cancer research: knowledge, technology, and resources. The integration of these three key sectors provides an opportunity for exponential progress.

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While I hope that someday we will find a cure for most cancers, that goal has thus far proved elusive. I am aiming for a very different, far more realistic and achievable goal—eliminating suffering and death due to cancer, so that people can live with, not die from, the disease.

At first, the goal may seem illusive or unattainable, but we can achieve the 2015 goal if we reach for it. Allow me to explain the rationale for the goal and how preemption of the cancer process will make this goal achievable. We owe it to all cancer patients—and their families—to meet this challenge.

EXAMPLES OF OUR EXPONENTIAL GROWTH IN KNOWLEDGE

We are experiencing exponential growth in our knowledge of cancer and in the technologies that further enable research. Together, these forces will accelerate our understanding of cancer as a disease process, a process we can learn to control.

One strong indicator of our growth in knowledge is the number of published research papers on cancer. When the National Cancer Act was signed in 1971, there were about 130,000 published research papers on cancer, but today almost 1.5 million papers are available.

More important than numbers of publications, however, is the profound new understanding that they have provided. We no longer see the cell as a mysterious envelop of protoplasm, but rather as a robust and intricate machine that responds with precision to a variety of signals and stimuli. We have learned that normal cells must decode, filter, and respond properly to many molecular conversations.

Today, we understand cancer as both a genetic disease and a cell signaling failure. Genes that control orderly replication become damaged, allowing the cells to reproduce without restraint. A single cell's progress from normal, to cancer, to metastasis appears to involve a series of interactive processes, each controlled by a gene or set of genes. These altered genes produce defective protein signals, which are, in turn, mishandled by the cell. We are also learning how a cancer cell communicates and interacts with the environment, both at the level of tumor-stromal interactions and tumor-host interactions. Our increased understanding of cancer biology is enabling us to design interventions to preempt cancer's progression and, ultimately, to prevent suffering and death.

We are also benefiting from a dramatic explosion in enabling technologies. At the service of today's researchers are gene and protein microarrays, high-throughput assays, robotics, high-resolution NMR (nuclear magnetic resonance), functional imaging, artificial intelligence, supercomputing and, more recently, nanotechnology and iRNAs (interference RNAs). Such sophisticated technology is being applied to better understand how genes and proteins interact in normal and cancerous cellular networks. These technologies, coupled with new disciplines such as genomics and proteomics, are improving our ability to predict cancer risk and to detect and diagnose cancer earlier. Artificial intelligence and supercomputing already have been harnessed successfully to analyze proteomic patterns for signatures of early-stage ovarian cancer.

New technologies are also making a huge difference in new drug discovery. High throughput robotic screens, combinatorial chemistry, and new probes for functional imaging are changing how molecular targets are identified and validated, and even how new interventions are designed. Also, enhanced computing power enables bioinformatics to link the work of researchers across disciplines, so that interdisciplinary teams of scientists can rapidly and effectively share information, insights, and accrual onto clinical trials. With the surge in the amount of biomedical data that we are now collecting, employing bioinformatics to share and analyze these data efficiently and effectively is key to speeding delivery of an end product to the public.

These new enabling technologies are creating a classic 'chain reaction,' not unlike what the world witnessed when scientists first discovered the secrets of the atom. Scientific discovery is fueling further scientific discovery at an ever-increasing rate of progress. This explains the exponential trajectory of our progress.

NCI'S STRATEGY

We will focus our efforts and accelerate our progress with what I call the "seamless three-D" approach to cancer research—discovery, development, and delivery.

Discovery is the process that generates new knowledge about fundamental cancer-related processes at the genetic, molecular, cellular, organ, person, and population levels.

Development is the process of creating and evaluating tools and interventions to reduce cancer burden including the prevention, detection, diagnosis, and treatment of cancer and its sequelae.

Delivery is the process of disseminating, facilitating and promoting evidence-based prevention, detection, diagnosis and treatment practices and policies to reduce the burden of cancer in all segments of the population. We must especially focus our efforts on populations who bear the greatest burden of disease.

Beyond reducing the lag time from bench to bedside, this seamless three-D strategy will also offer important dividends to the research and

clinical communities. Investing in initiatives that create greater seamlessness between the three Ds will yield new tools and new platforms for collaboration that will enable us to test ideas quickly and move worthy science forward faster and better than ever before.

Along with several key ongoing initiatives, such as molecular imaging and proteomics, we are developing new initiatives and priorities in seven key areas: molecular epidemiology; integrative cancer biology; strategic development of cancer interventions, including an historic partnership with the Food and Drug Administration (FDA) to accelerate approval of drugs and devices; early detection, prevention and prediction; an integrated clinical trials system; bioinformatics; and overcoming health disparities.

The basic strategy in all of these initiatives is to create an "enabling culture" by using NCI resources to remove barriers that currently inhibit progress across the discovery-development-delivery continuum. Whether re-engineering the clinical trials system to safely accelerate progress of new interventions through the pipeline, using bioinformatics to link people and data together, or investing in research to explain the social, cultural, environmental, biological, and behavioral determinants of cancer disparities, we have an opportunity to accelerate progress throughout the field of cancer research by eliminating bottlenecks.

LOOKING FORWARD

There are 100 new cancer drugs in the Phase III stage of clinical trials testing. But given that only a handful of drugs receive FDA approval every year, it is obvious we need to do what we can to improve the process. That is why we're working jointly with the FDA on building a partnership in several areas of cancer research. The NCI-FDA Clinical Proteomics Program already has developed a promising screening tool for ovarian cancer and more recently has developed a technique to evaluate drug efficacy.

But let's be clear. There is not going to be one single intervention that cures all cancers. Instead, we are looking for combinations of agents or therapies that work together to shut down cancer at vulnerable points in the progression process.

As the number of drugs that benefit patients continues to grow, the number of cancer survivors also continues to increase. We've taken several steps to reduce the suffering of cancer survivors, and we will continue to be aggressive in this important area. First, we've renewed our focus on symptom management and palliative care. Our Community Clinical Oncology Program (CCOP) supports some 60 clinical trials investigating such symptoms as cognitive dysfunction, fatigue, hot flashes, pain, nausea, and vomiting. Much remains to be done. We need to develop less debilitating treatments, and we're exploring more effective ways to support patients and their families during treatment and in the post-treatment phase. Second, and perhaps more importantly, by slowing the progression of cancer and turning it into a manageable disease, suffering and death will be reduced.

I believe that by 2015, we can bring many cancers under control as chronic, manageable diseases, much like diabetes and heart disease. And one day, we may even eliminate cancer, but not in the near future. What is foreseeable is expanding our ability to eliminate the worst aspects of the cancer experience—suffering and premature death.

That's why we have issued this challenge goal—to focus ourselves on reducing the burden of cancer. We are especially committed to reducing this burden for those who bear the greatest share. We are committed to the elimination of disparities by working together with other federal agencies, the National Dialogue on Cancer, and organizations such as the Intercultural Cancer Council. No one in our country will suffer and die from cancer when we achieve this goal. Those who suffer most today will benefit most from our success tomorrow.

I invite you to join with NCI in whatever ways you can to pursue this goal. More information about the 2015 challenge goal and other NCI programs can be found at www.cancer.gov.